



COMPARATIVE STUDY BETWEEN BUCCAL MUCOSAL GRAFT URETHROPLASTY AND ENDOSCOPIC URETHROTOMY (OIU)

Urology

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ABSTRACT

Introduction: Urethral stricture is a common cause of difficulty in passing urine in men. The stricture is usually sited in the bulbar part of the urethra causing symptoms such as reduced urine flow. Initial treatment is typically by endoscopic urethrotomy but recurrence occurs in about 50-60% of men. The alternative of open urethroplasty involves surgically reconstructing the urethra, which may need a buccal mucosal graft (BMG). In the absence of firm evidence as to which is best, individual men have to trade off the invasiveness and possible benefit of each option. This comparative study was done to know which is better between open and endoscopic approach in terms of recurrence and outcome.

Material and Methods: From March 2018 to September 2018 we analysed 36 patients presenting with symptoms of urethral stricture disease like urgency, frequency of urination, poor urinary stream. Out of 36 patients, 20 underwent endoscopic urethrotomy while 16 patients underwent BMG urethroplasty. Participants were followed for 6-12 months measuring symptoms, flow rate, recurrence and the need for re-intervention.

Result: Mean stricture length was 3.5 ± 0.8 cm. During follow-up two patients developed stricture formation in patients undergoing BMG urethroplasty while 10 developed stricture in patients undergoing OIU. Success rate was 87.5% in BMG urethroplasty and 50% in OIU.

Conclusion: Buccal mucosal graft urethroplasty provides excellent results for anterior urethral stricture than OIU.

KEYWORDS

buccal mucosal graft, urethroplasty, stricture, oiu

INTRODUCTION:

Urethral stricture is a fibrotic narrowing of urethral lumen. Men suffer urethral stricture because of scar formation in the urethral mucosa. Scar occurs due to previous urethral instrumentation or trauma. It is the commonest cause of difficulty in passing urine among younger and middle aged men. Men seek help for urethral stricture because of progressive problems in passing urine including reduced urine flow. Urethra is divided into anterior (penile and bulbar) and posterior (membranous and prostatic) urethra. The stricture is typically 1-5 cm long and mostly located in bulbar urethra. The site and length of a stricture is characterised by endoscopic inspection and urethrographic imaging and degree of restriction to urine flow measured by maximum flow rate. Symptomatic men with a bulbar stricture need surgical treatment to widen the narrowed section. This can be done by either endoscopic approach or by open urethroplasty. Endoscopic approach is associated with high recurrence rate. Open urethroplasty can be done using substitution material like Buccal mucosal graft. Buccal mucosa offers the advantage of being accustomed to a wet environment, have good vascularity, hair less, easy to harvest, thick epithelium, less contracture so less chance of stricture recurrence¹. Though Humby had described the use of buccal mucosa for urethral substitution in 1941, it has become popular only after 1990². We present a comparative study of our experience with buccal mucosal graft urethroplasty and optical internal urethrotomy (OIU).

MATERIALS AND METHODS:

Between March 2018 to September 2018, out of 36 patients, 20 underwent OIU for urethral stricture and 16 patients underwent BMG urethroplasty. Each patient was evaluated with detailed case history physical examination, uroflowmetry with residual urine measurement, urine culture and imaging study with retrograde urethrogram (RGU) and voiding cystourethrogram (VCUG). Regional anesthesia was given and the patients were positioned in lithotomy position.

Two surgical interventions were investigated:

1. Optical internal Urethrotomy: The standard intervention of endoscopic urethrotomy typically takes 45 minutes. The endoscope is passed along the lubricated penile urethra to locate the distal end of the stricture. A fine-calibre wire guide is then passed through the stricture to the bladder. Using this guide, the stricture is progressively divided longitudinally using the mounted scalpel in the dorsal '12 o'clock' orientation until the proximal end of the stricture is reached. The instrument is withdrawn and a 16 French calibre silicon catheter inserted through the urethra to the bladder and left on free drainage³. The patient recovers on the ward and is discharged usually with the catheter still in place. He returns to hospital after an interval or remains as an inpatient (typically 2-3 days) for catheter removal and voiding check.
2. BMG Urethroplasty: BMG urethroplasty involves the reconstruction of the urethra through an appropriately sited longitudinal skin incision made in the perineum beneath the scrotum between the legs. The surgery takes 2-3 hours. The bulbar urethra is located through the skin incision and mobilised. The strictured segment is incised longitudinally with the cut extending into visibly healthy urethra proximally and distally. For all cases a graft of oral mucosa is inserted to widen the strictured area of urethra⁴. The graft (typically 5 cm by 2 cm) is harvested according to a standard technique from the inner cheek or lower lip with the donor site left open to heal spontaneously⁵. The graft is prepared, positioned appropriately, sutured to the cut urethral edges, and stabilised on the deeper tissues within the perineal wound. This incorporates the graft mucosal surface into the lumen of the urethra. A 14 French calibre silicon catheter is then passed to the bladder and left in situ on free drainage. The patient recovers on the ward before discharge home. The patient returns after an interval typically 2-3 weeks for an X-ray urethrogram to check

leak-free healing, and catheter removal.

The participants were followed at 3, 6 and 12 months for recurrence or voiding difficulty. Successful outcome was defined as normal voiding after catheter removal and no need for further intervention.

RESULTS:

Total of 36 patients underwent urethroplasty during the time period March 2018 to September 2018. The mean age of the patients was 47.2 years. The commonest site of stricture was Bulbar, present in 24 patients (table 1).

Table 1 - Site of stricture

Site	No. of patients
Bulbar	24
Penile	12
Total	36

The mean AUA symptom score was 23.2ml. The mean preoperative Maximum flow rate was 7.2 ml/s with mean residual volume 89.2 ml (Table 2). Urine culture was done before surgery, 17 cultures were negative, 12 had insignificant bacteriuria and 7 showed significant bacteriuria. The mean operative time was 133 minutes (110 to 160 minutes) in BMG urethroplasty and 47 mins (30-75 minutes) in OIU. No patients required post-operative blood transfusion.

Table 2 - Pre-operative Parameters

Parameters	Mean
Age of patients	47.2 years
AUA symptom score	23.2 ml
Pre-op Qmax	7.2 ml
Pre-operative mean residual volume	89.2 ml
Mean stricture length	3.5 ± 0.8 cm

None of our patients had donor site complications. The follow up period was 12 months. During follow-up period 2 patients developed stricture formation in patients undergoing BMG urethroplasty while 10 developed stricture in patients undergoing OIU.

DISCUSSION:

Urethral strictures were documented in ancient literature dating from Greek and Egyptian period. Continuous attempts are made in different parts of the world in different centres to find out an ideal method of treatment according to the merit of individual type of stricture. Significant progress made over the last 15 years. Long anterior urethral stricture (> 2 cm) should be treated with substitution urethroplasty to avoid postoperative chordae formation⁶. Substitution urethroplasty may be a patch graft or tube graft^{7,8}. Free skin grafts used as patch or tube graft in substitution urethroplasty are associated with complications like graft shrinkage, diverticulum formation and recurrent stricture. Humby was the first to use buccal mucosa for urethral reconstruction in a series of single stage hypospadias repair. However, BMG urethroplasty has emerged as a popular technique in 1990s. In different series, onlay BMG urethroplasty has shown a success rate from 87.5% to 100% with a follow-up ranging from 22 to 41 months^{9,10}. Recently, Barbagli et al. published a retrospective study of 50 cases with bulbar urethral stricture where buccal mucosal graft urethroplasty were done¹¹. In our series of 16 out of 36 cases, only two patients developed re-stricture at proximal at anastomotic sites as compared to OIU in which 10 patients developed re-stricture. One patient developed stricture within 3 months of operation and another one showed evidence of stricture on RGU after 6 months of operation. These two (12.5%) were considered as failure, because these patients developing stricture after BMG urethroplasty and needed surgical intervention. In our series the success rate was 87.5% which was nearly similar to the other studies. Our follow-up was long enough 12 months.

CONCLUSION:

In our study, it has been shown that dorsal BMG urethroplasty is a reliable and satisfactory procedure to manage bulbar urethral strictures as compared to OIU. It is also associated with minimal complications and fewer recurrences harvesting the graft are simple.

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